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EXAMINER

MATTIS, JASON E

ART UNIT PAPER NUMBER

2665

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/822,457

Applicant(s)

CHOI, SUNGHYUN

Examiner

Jason E Mattis

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/28/02, 3/30/01</u>.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input type="checkbox"/> Other: ____.</p> |
|--|--|

DETAILED ACTION

Drawings

1. Figures 1, 2(a), and 2(b) should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 1 is objected to because of the following informalities:

Line 6 of claim 1 uses the term "said access point". Since there is no prior reference of an access point in claim 1, it is recommended that this term be changed to "an access point".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 2-3 and 7-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, each of these claims either directly, or through dependence on another claim, contains a limitation similar to the limitation of claim 2 that states, "granting said concurrent transmission of information packets between said pairs of stations without the intervention of said access point". There is no support for this claimed limitation in the specification. The specification discloses embodiments in which an access point is used to assign a time slot to a pair of stations, so that the stations can communicate with each other. Although the specification does disclose that the access point is not needed to relay data from one station to the other station, the access point does intervene by assigning the time slots to be used by the two stations in their data transmission. There is no embodiment described in the specification in which pairs of stations are granted to transmit information without intervention of the access point, since in all embodiments the access point is used to assign time slots.

Art Unit: 2665

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. First, part (ii) of claim 8 states, "the present power level of said station for data transmission". It is unclear what specific station is being referenced by "said station". Both a "plurality of stations" and "active stations" claimed in claim 7, which claim 8 depends on, but no single station is discussed. Second, it is unclear what is meant by part (iii) of claim 8, which states, "the rate of said transmission for data transmission". It is unclear what specific transmission is being referenced by "said transmission".

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1 and 4-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Leung et al. (U.S. Pat. 6,262,980).

With respect to claim 1, Leung et al. discloses a method for providing concurrent communication between a plurality of stations via radio transmissions in a time division multiplexing access communications system **(See the abstract and column 6 lines 15-49 of Leung et al. for reference to providing concurrent transmission between terminals, which are stations, in a TDMA system)**. Leung et al. also discloses periodically broadcasting a signal message including a plurality of assigned TDM time slots from an access point to the plurality of stations over a wireless communication channel **(See column 8 lines 4-27 of Leung et al. for reference to each sector of each cell broadcasting a message to assign time slots for transmitting packets to or from terminals)**. Leung et al. further discloses each station transmitting at least one data indicative of an interference power level from adjacent stations **(See column 9 line 29 to column 10 line 5 and Figure 4 of Leung et al. for reference to each terminal taking interference measurement from other transmitters and using the interference measurements to assign the terminals to an interference class that is updated periodically and transmitted to the base station)**. Leung et al. also discloses determining optimal pair of a transmitting station and a receiving station that are hidden from each other based on the received interference power level **(See column 10 lines 21-31 and column 10 line 65 to column 11 line 29 and Figure 6 of Leung et al. for reference to based on the interference class of each terminal, assigning the terminals to time slots for transmission, with terminals that can handle concurrent transmission being assigned a concurrent timeslot with other terminals)**. Leung et al. further discloses

Art Unit: 2665

broadcasting the determination to the plurality of stations (**See column 8 lines 4-27 of Leung et al. for reference to each sector of each cell broadcasting a message to assign the time slots, including timeslots for concurrent transmission, for transmitting packets to or from terminals).**

With respect to claim 4, Leung et al. discloses that optimal pairs are selected if the receiving stations of the optimal pairs are different from each other (See column 8 lines 4-27 of Leung et al. for reference to the terminals that are participating in the concurrent transmission in the same time slots being in different sectors, meaning the pairs of concurrently transmitting terminals will always be different terminals because they are in different sectors).

With respect to claim 5, Leung et al. discloses that optimal pairs are selected if the receiving station has been receiving signals consistently from the same transmitting station (See column 7 lines 12-21 of Leung et al. for reference to the system having fixed terminals meaning the terminals participating in the concurrent transmission all always receive signal consistently from the same transmitting sector).

With respect to claim 6, Leung et al. discloses that optimal pairs are selected if the receiving stations of the optimal pairs have not performed a handoff from one network to another network (See column 7 lines 12-21 of Leung et al. for reference to the system having fixed terminals meaning there is no handoff performed from one sector of the system to another sector of the system for any terminal participating in the concurrent transmission).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-3, 7, and 9-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leung et al. in view of the Adachi et al. article (*A Study on Channel Usage in a Cellular Ad-Hoc United Communication System for Operational Robots*).

With respect to claim 2, Leung et al. does not disclose granting concurrent transmission of information packets between pairs of stations without the intervention of the access point.

With respect to claim 7, Leung et al. discloses a method of providing concurrent communication between a plurality stations via radio transmissions (**See the abstract and column 6 lines 15-49 of Leung et al. for reference to providing concurrent transmission between terminals, which are stations**). Leung et al. also discloses maintaining a table of active stations including a current data transmission schedule and interference level (**See column 8 lines 4-27, column 9 line 29 to column 10 line 5, and Figure 4 of Leung et al. for reference to storing an interference class of each active terminal in the base stations of the system, which also contain information**

regarding the time slots assigned to each terminal). Leung et al. further discloses periodically broadcasting over a wireless communication channel a signal message from the AP to the stations including a request to transmit at least one data indicative of interference power level information **(See column 9 line 65 to column 10 line 5 of Leung et al. for reference to periodically updating the interference classification of each terminal by requesting the terminals to monitor reception quality through a measurement and statistic collection).** Leung et al. also discloses each station reporting the interference information to the access point **(See column 9 line 29 to column 10 line 5 and Figure 4 of Leung et al. for reference to each terminal taking interference measurement from other transmitters and using the interference measurements to assign the terminals to an interference class that is updated periodically and transmitted to the base station).** Leung et al. further discloses determining at least one pair that are hidden from each other and granting concurrent transmission of information packets between pairs of stations **(See column 10 lines 21-31 and column 10 line 65 to column 11 line 29 and Figure 6 of Leung et al. for reference to based on the interference class of each terminal, assigning the terminals to time slots for transmission, with terminals that can handle concurrent transmission being assigned a concurrent timeslot with other terminals).** Leung et al. does not disclose that the concurrent transmission occurs without the intervention of the access point.

Art Unit: 2665

With respect to claim 10, Leung et al. does not disclose transmitting and receiving information packets between the stations without the intervention of the access point.

With respect to claim 15, Leung et al. discloses a radio transmission system for providing concurrent transmission (See the abstract and column 6 lines 15-49 of Leung et al. for reference to providing concurrent transmission between terminals, which are stations, in a wireless communication system). Leung et al. also discloses a plurality of stations having a radio coverage area and being operative to transmit information via an assigned TDM time slot (See column 6 lines 15-49 of Leung et al. for reference to a plurality of terminals having a radio coverage are an transmitting information in a TDMA network, meaning the network uses assigned time slots). Leung et al. further discloses at least one access point broadcasting over a wireless communication channel a request to transmit data indicative of interference power level at which a particular station is able to received from adjacent stations (See column 9 line 65 to column 10 line 5 of Leung et al. for reference to periodically updating the interference classification of each terminal by requesting the terminals to monitor reception quality through a measurement and statistic collection). Leung et al. does not disclose the system being a wireless LAN with data signals between multiple pairs of the stations being exchanged concurrently without the benefit of the access point.

With respect to claim 16, Leung et al. discloses a means for determining concurrent transmission candidates from the reported interference level and a mean for

Art Unit: 2665

modulating/demodulating signals received from/to the access point and transmitting the received signals at a different time slot from which the signals were received (**See column 10 lines 21-31 and column 10 line 65 to column 11 line 29 and Figure 6 of Leung et al. for reference to based on the interference class of each terminal, assigning the terminals to time slots for transmission, with terminals that can handle concurrent transmission being assigned a concurrent timeslot with other terminals and for reference to uplink and downlink transmission being in different timeslots since the system is a TDMA system**). Leung et al. does not disclose a means for interfacing the plurality of stations to a WLAN.

With respect to claims 2, 7, 10, and 15-16, Adachi et al., in the field of communications, discloses a system and method of interfacing stations in a WLAN and exchanging data between pairs of stations without the benefit or intervention of an access point (See sections 3.1.1-3.1.2 on pages 1502-1503 of Adachi et al. for reference to interfacing mobile terminals in an ad-hoc LAN with the stations being capable of exchanging data without using a base station, which is an access point, when the path loss between the terminals themselves is less than the path losses between the terminals and the base station). Interfacing stations in a WLAN and exchanging data between pairs of stations without the benefit or intervention of an access point has the advantage of reducing the amount of communication channels needed to exchange the data since only one channel is needed for a direct transmission between stations without an access point while two channels are needed if the access point is used to relay the data between the stations.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Adachi et al., to combine interfacing stations in a WLAN and exchanging data between pairs of stations without the benefit or intervention of an access point, as suggested by Adachi et al., with the system and method of Leung et al., with the motivation being to reduce the amount of communication channels needed to exchange the data since only one channel is needed for a direct transmission between stations without an access point while two channels are needed if the access point is used to relay the data between the stations.

With respect to claims 3 and 11, Leung et al. discloses that the communication between the access point and the stations is performed via a time division multiplexing access technology (See column 6 lines 44-49 of Leung for reference to the system being a TDMA system).

With respect to claim 9, Leung et al. discloses broadcasting the determination to the plurality of stations (See column 8 lines 4-27 of Leung et al. for reference to each sector of each cell broadcasting a message to assign the time slots, including timeslots for concurrent transmission, for transmitting packets to or from terminals).

With respect to claims 12 and 19, Leung et al. discloses that the concurrent transmission is granted if the receiving stations of the pairs are different from each other (See column 8 lines 4-27 of Leung et al. for reference to the terminals that are participating in the concurrent transmission in the same time slots being in

Art Unit: 2665

different sectors, meaning the pairs of concurrently transmitting terminals will always be different terminals because they are in different sectors).

With respect to claims 13 and 20, Leung et al. discloses that concurrent transmission is granted if the receiving station has been receiving signals consistently from the same transmitting station (See column 7 lines 12-21 of Leung et al. for reference to the system having fixed terminals meaning the terminals participating in the concurrent transmission all always receive signal consistently from the same transmitting sector).

With respect to claims 14 and 22, Leung et al. discloses that the concurrent transmission is granted if the receiving stations have not performed handoff from one network to another network (See column 7 lines 12-21 of Leung et al. for reference to the system having fixed terminals meaning there is no handoff performed from one sector of the system to another sector of the system for any terminal participating in the concurrent transmission).

With respect to claim 17, Leung et al. discloses a means for storing data indicative of a particular time at which the transmission of the data packet is scheduled to start and end (See column 9 line 5 to column 10 line 5 and Figures 5-6 of Leung et al. for reference to assigning the transmission of packets from terminals to time slots, which have definite state and end times, in a frame and storing the information regarding which time slot has been assigned to which terminal).

With respect to claim 18, Leung et al. discloses that the access point provides timing signals for the stations (Since the system of Leung et al. is a TDMA system,

Art Unit: 2665

the base stations of Leung inherently must provide a timing signal to the stations so that the transmission of data in time slots from the stations is synchronous with the timing of the reception of the data in the assigned time slots).

With respect to claim 21, Leung et al. discloses selecting the optimal pairs based upon the interference power level of a given station being greater than a threshold value (See column 9 line 29 to column 10 line 5 and Figure 4 of Leung et al. for reference to comparing measured interference levels to a threshold value during the terminal classification procedure, meaning a threshold value is used to determine which terminals can participate in concurrent transmission).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason E Mattis whose telephone number is (571) 272-3154. The examiner can normally be reached on M-F 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2665

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jem

A handwritten signature in black ink, appearing to read 'Huy D. Vu', with a stylized flourish at the end.

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600